

# PATENT ABSTRACTS OF JAPAN

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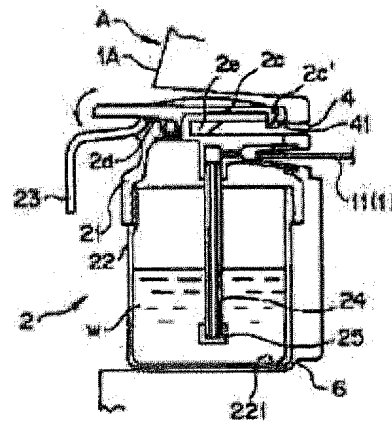
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## (54) OXYGEN CONCENTRATING DEVICE FOR OXYGEN THERAPY

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide an oxygen concentrator for oxygen therapy, such that installation and removal of a humidifier part are made easier.

**SOLUTION:** In an oxygen concentrating device A for oxygen therapy, which comprises a concentrated oxygen gas generator 1, a humidifier 2 for humidification, and an oxygen supply port through which the concentrated oxygen gas humidified is put to use, and in which the generator and the oxygen supply port are placed on the main body 1A side of the oxygen concentrating device while the humidifier is freely removably attached to the main body part, the humidifier has a lid part 21 and a container part 22 storing humidifying water, and the lid part has at its top a communicating part which, when the humidifier is mounted in the main body part, communicates with the gas releasing part 11 of the generator placed on the main body part and with the gas taking part of the oxygen supply port. The lid part has at its top a freely rotating engaging piece 2c which, when the humidifier is mounted in the main body part, is freely removably engaged with an engaging part 4 placed on the main body part.



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CLAIMS

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[Claim(s)]

[Claim 1]A concentrating oxygen concentrated gas generation machine (1) with which an oxygen density for oxygen therapy makes concentrating oxygen concentrated gas with low humidity generate highly, A humidifier (2) for humidifying concentrating oxygen concentrated gas from said generation machine (1), And an oxygen supply port (3) which presents use with concentrating oxygen concentrated gas humidified from said humidifier (2), While being an oxygen enricher for the oxygen therapy, \*\* and others, (A) and allocating said generation machine (1) and an oxygen supply port (3) in the body part (1A) side of an oxygen enricher (A), Said humidifier (2) in an oxygen enricher for oxygen therapy of structure (A) which makes slide to said body part (1A) and with which it is equipped enabling free attachment and detachment (i). aforementioned humidifier (2), Have a container part (22) which accommodates a covering device (21) and humidifying water, and it is constituted, and (ii). aforementioned covering device (21), a communicating part (2a.) which is open for free passage to each of a gas-evolution part (11) of said generation machine (1), and a gas taking-in part (31) of an oxygen supply port (3) which was allocated in the upper part (211) at the body part (1A) side at the time of wearing to a body part (1A) of a humidifier (2) Have 2b), and it is constituted and (iii). aforementioned covering device (21) in the upper part (211). An oxygen enricher for oxygen therapy which having an engagement piece (2c) which engages with an engagement part (4) allocated in the body part (1A) side at the time of wearing to a body part (1A) of a humidifier (2) enabling free attachment and detachment, and which can be rotated, and constituting.

[Claim 2]The oxygen enricher for oxygen therapy according to claim 1 whose humidifier (2) is what has a handle portion (23).

[Claim 3]The oxygen enricher for oxygen therapy according to claim 1 which is what an engaging mechanism of an engagement piece (2c) of an engagement part (4) and a covering

device (21) of a body part (1A) depends on engagement of a crevice (41) of an engagement part (4), and heights (2c') of an engagement piece (2c).

[Claim 4]The oxygen enricher for oxygen therapy according to claim 1 which spring energization of the rotation of an engagement piece (2c) of a covering device (21) of is enabled, and is allocated in the upper part (211) of a lid (21).

[Claim 5]The oxygen enricher for oxygen therapy according to claim 1 which is what has an inside of a proposal (5) which it shows to the upper part (211) of a covering device (21) in order that a body part (1A) may carry out wearing guidance of the humidifier (2) to a body part (1A).

[Claim 6]The oxygen enricher for oxygen therapy according to claim 1 which is what has a positioning projected part (6) which contacts a pars basilaris ossis occipitalis (221) of a container part (22) of a humidifier (2) in order that a body part (1A) may position a humidifier (2) with which a body part (1A) is equipped.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the generator of the condensed oxygen gas used as oxygen therapy to a chronic respiratory failure patient (it may only be hereafter called a patient.) etc., i.e., the oxygen enricher for oxygen therapy, (it may only be hereafter called an oxygen enricher.).

[0002]It is related with the oxygen enricher made into the thing of structure which can deal with safely and easily the humidifier which is a component in which it is detailed and an oxygen enricher is important for this invention.

[0003]This invention relates to the oxygen enricher which made the humidifier which is an important component of an oxygen enricher the thing of the structure which can be dealt with safely and simple by operation of a patient's one hand in consideration of a patient's physical strength, aging, etc. in detail.

[0004]

[Description of the Prior Art]In the domiciliary oxygen therapy (Home Oxygen Therapy;HOT) over a chronic respiratory disease, the oxygen enricher is widely used as the important tool. In said HOT, the method and air which use an oxygen cylinder, liquid oxygen, etc. as an oxygen supply system are processed by adsorbent, such as zeolite, and there are a method which obtains condensed oxygen gas, and a method which uses what is called an adsorbed type gas oxygen enricher.

[0005]The latter oxygen enricher has spread widely from excelling in simplicity, lightweight small size, low noise nature, etc. while the oxygen supply stable by remarkable improvement art in recent years is secured.

[0006]The outline of this kind of conventional adsorbed type oxygen enricher (A') is shown in drawing 8. So that it may be illustrated this kind of conventional adsorbed type oxygen enricher

(A'), (i). an oxygen density being high and by mainly adsorbing nitrogen and the moisture in the air using adsorbent, while incorporating air, And the concentrating oxygen concentrated gas generation machine which makes concentrating oxygen concentrated gas with low humidity generate (1'), (ii). the humidifier (2') for humidifying the concentrating oxygen concentrated gas from said generation machine (1'), and (iii). -- it comprises an oxygen supply port (3') for presenting use with the concentrating oxygen concentrated gas humidified from said humidifier (2'). In drawing 8, each component (1', 2', 3') of the above mentioned oxygen enricher (A') is shown roughly. Said oxygen supply port (3') supplies the humidified concentrating oxygen concentrated gas to a patient's regio nasalis or mask (regio oralis) with cannula like a graphic display.

[0007]As drawing 8 explained, in this kind of oxygen enricher (A'), a humidifier (2') is an important component. When this is supplied to a patient as it is, a patient's nasal cavity membrane dries and it makes pain induce in a generation machine (1'), although dry (low humidity) concentrating oxygen concentrated gas is obtained. Therefore, a humidifier (2') is indispensable because of the humidity control of concentrating oxygen concentrated gas.

[0008]Said humidifier (2') must satisfy the following needs seen from the field of handling operation of a patient side. Since an oxygen enricher (A') is used over a long period of time all day and night, daily removal and its frequency of attachment are high because of a liquid supplement of a humidifier, washing, etc. For this reason, consideration of a patient's physical strength, the inexperience on handling, the fall of thinking power, etc. desires strongly a thing of the method which removal of a humidifier (2') and operation of attachment can hold simple and certainly.

[0009]As described above, in an oxygen enricher (A'), a humidifier (2') is an important component and various improvement has been made. Hereafter, the example of 2-3 which are proposed about the handling of a humidifier (2') is explained.

[0010](i). JP,H6-39008,U: -- the main purpose of the device indicated by this published unexamined application detects whether attachment of a device body part and a humidifier is normal in the oxygen enricher of medical application, and when imperfect, it is related with the oxygen enricher for oxygen therapy which emitted the alarm. On the other hand, said published unexamined application is relation with said alarm system (alarm style), and is also indicating the mechanism which allocates a humidifier to a device body part enabling free attachment and detachment.

[0011]however, the upper part of the opening knob which constitutes the alarm system with which the thing of the indication to said published unexamined application serves as maintenance of a humidifier -- pushing up -- the opening knob concerned opens the holding state of a humidifier while operating MACROSS Izzi for alarm signal generating. And the patient can demount the humidifier (lock release was carried out) with which the holding state

was wide opened as a following step from a device body part. That is, the thing of an indication of said published unexamined application cannot demount a humidifier from a device body part safely and easily with the one-touch method by a patient's one hand.

[0012](ii). JP,H5-154200,A: -- the invention indicated by this published unexamined application has proposed what made attachment of a humidifier and removal simple in the concentrated oxygen gas feed unit of medical application. In the concentrated oxygen gas feed unit of the medical application which has in detail a means (junction maintaining structure) by which the invention of an indication combines a humidifier with said published unexamined application to the humidifier seat part by the side of a device main frame, As a mechanism which demounts a humidifier from said seat part, the pressing movement of the opening knob of junction maintaining structure is made to carry out leftward, the tip of a fastening plate is removed from the trailer of a humidifier, and the thing of a method (lock release is carried out.) which opens the holding state of a humidifier is indicated.

[0013]However, the thing of said method cannot demount a humidifier from a device body part safely and easily with the one-touch method by a patient's one hand, either.

[0014](iii). JP,H5-154201,A: -- the invention indicated by this published unexamined application has also proposed what made attachment of a humidifier and removal simple for said JP,H5-154200,A in the concentrated oxygen gas feed unit of medical application similarly. The invention of the indication to said published unexamined application receives the humidifier seat part by the side of a device main frame in detail, Along with the guide of said seat part, move a humidifier, and it positions, Subsequently, the feed unit of the method which sets a humidifier seat part and a humidifier so that the concentrated oxygen gas drawn from the generating means of concentrated oxygen gas in a device main frame may be supplied to a humidifier is indicated by operating the set knob allocated in said seat part. In said device, a humidifier will be in the state where it can demount from a humidifier seat part (if another word is carried out the device main frame side), by operating a set knob so that the holding state of a humidifier seat part and a humidifier may be opened (lock release).

[0015]However, the thing of said method as well as what was explained previously cannot demount a humidifier from a device body part safely and easily with the one-touch method by a patient's one hand.

[0016]

[Problem(s) to be Solved by the Invention]This invention is originated in view of the limit seen from the fault of the above mentioned conventional oxygen enricher, and the handling nature of the humidifier which is especially the important component.

[0017]This invention persons added examination wholeheartedly that the fault of the handling nature of the humidifier proposed from the above mentioned former should be canceled. As a result, in the oxygen enricher which has attachment and a humidifier which can be demounted

in a sliding type to the main part of an oxygen enricher, A patient is one hand by having two incomes with the locking piece which is allocated by the suspending portion allocated in the main part side of an oxygen enricher, and the covering device of a humidifier, enabling free rotation, and is engaged [ said suspending portion and ] and stops, and it found out attachment and that it could demount for the humidifier to the oxygen enricher with the one-touch method. [0018] This invention uses said knowledge as a base, and is completed. The oxygen enricher for oxygen therapy with high added value which incorporated the humidifier which a patient can deal with simple and certainly by this invention is provided.

[0019]

[Means for Solving the Problem] A concentrating oxygen concentrated gas generation machine (1) which will make concentrating oxygen concentrated gas with low humidity this invention generate highly [ an oxygen density for oxygen therapy ] if this invention is outlined, A humidifier (2) for humidifying concentrating oxygen concentrated gas from said generation machine (1), And an oxygen supply port (3) which presents use with concentrating oxygen concentrated gas humidified from said humidifier (2), While being an oxygen enricher for the oxygen therapy, \*\* and others, (A) and allocating said generation machine (1) and an oxygen supply port (3) in the body part (1A) side of an oxygen enricher (A), Said humidifier (2) in an oxygen enricher for oxygen therapy of structure (A) with which said body part (1A) is equipped enabling free attachment and detachment (i). aforementioned humidifier (2), Have a container part (22) which accommodates a covering device (21) and humidifying water, and it is constituted, and (ii). aforementioned covering device (21), a communicating part (2a.) which is open for free passage to each of a gas-evolution part (11) of said generation machine (1), and a gas taking-in part (31) of an oxygen supply port (3) which was allocated in the upper part (211) at the time of wearing to a body part (1A) of a humidifier (2) as for a body part (1A) side Have 2b), and it is constituted and (iii). aforementioned covering device (21) in the upper part (211). It is related with an oxygen enricher for oxygen therapy which having an engagement piece (2c) which engages with an engagement part (4) allocated in the body part (1A) side at the time of wearing to a body part (1A) of a humidifier (2) enabling free attachment and detachment, and which can be rotated, and constituting.

[0020]

[Embodiment of the Invention] Hereafter, Drawings are made reference and technical constitution and the embodiment of this invention are explained in detail. It is needless to say that this invention is not limited to the thing of a graphic display.

[0021] In the explanation which refers to the Drawings of the oxygen enricher (A) of this invention, the main component of a device is \*\* by which the oxygen enricher (A') shown in above mentioned drawing 8 (conventional technology) is referred to. In here, although the component of the oxygen enricher (A) of this invention is explained by the reference mark

without a dash sign, the conventional corresponding component is explained by with the dash sign.

[0022]Drawing 1 - drawing 3 are figures of this invention which illustrate an oxygen enricher [ like ] (A) the first operative condition. Drawing 1 is an important section explanatory view for explaining the attachment-and-detachment mechanism of a humidifier (2) to the body part (1A) of the oxygen enricher (A) of this invention. Drawing 2 is a top view of drawing 1. Drawing 3 is an I-I line sectional view of drawing 2.

[0023]As shown in drawing 1, the oxygen enricher (A) of this invention, As usual (refer to drawing 8), while the main component incorporates (i). air, An oxygen density is high by mainly adsorbing nitrogen and the moisture in the air using adsorbent, And the concentrating oxygen concentrated gas generation machine (1) which makes concentrating oxygen concentrated gas with low humidity generate, (ii). the humidifier (2) for humidifying the concentrating oxygen concentrated gas from said generation machine (1), and (iii). -- it comprises an oxygen supply port (3) which presents use with the concentrating oxygen concentrated gas humidified from said humidifier (2).

[0024]In the oxygen enricher (A) of this invention, said generation machine (1) and an oxygen supply port (3) are constituted so that it may be compactly allocated in the body part (1A) side of an oxygen enricher (A) and the body part (1A) side may be equipped with said humidifier (2), enabling free attachment and detachment.

[0025]And although the greatest focus of the oxygen enricher (A) of this invention is mentioned later in detail, it is at the point of the attachment-and-detachment mechanism to the body part (1A) of a humidifier (2), and its composition.

[0026]In the oxygen enricher (A) of this invention, it may be thought with the conventional thing that it is of the same kind so that other components or mechanisms may be explained below.

(i). said concentrating oxygen concentrated gas generation machine (1) is an adsorbed type thing using adsorbent, such as zeolite, and is constituted, for example. In this invention, it is needless to say that a concentrating oxygen concentrated gas generation machine (1) includes other supply sources which supply high-concentration oxygen gas rather than air, such as an oxygen cylinder and liquid oxygen.

(ii). the oxygen supply port (3) which presents use with said concentrating oxygen concentrated gas, The concentrating oxygen concentrated gas which comprised apparatus which supplies the humidified concentrating oxygen concentrated gas which is drawn from a humidifier (2) to a patient, for example, was humidified through Kanew RAHOSU is supplied to a patient's nostril (nose KANYURA method) or the mouth (mask method).

[0027]Next, the attachment-and-detachment mechanism to the body part (1A) of the humidifier (2) which is the greatest focus of the oxygen enricher (A) of this invention, and its composition are explained in detail hereafter. In order to be only operation by a patient's one hand and to



make it equip with a humidifier (2) by a one-touch method to the body part (1A) of an oxygen enricher (A), enabling free attachment and detachment as shown in drawing 1 - drawing 3, the composition of both a humidifier (2) and a body part (1A) is specified as follows.

[0028](i). the humidifier (2) of this invention has a container part (22) which accommodates humidifying water, such as a covering device (21) and distillation refining water, and a handle portion (23), and is constituted.

(ii). and a first half covering device (21) with the gas-evolution part (11) of the generation machine (1) allocated in the upper part (211) at the body part (1A) side at the time of wearing to the body part (1A) of a humidifier (2). It has a communicating part (2a, 2b) which is open for free passage to each of the gas taking-in part (31) of an oxygen supply port (3), and is constituted.

(iii). further -- said -- a covering device -- (-- 21 --) -- the -- the upper part (211) -- a humidifier -- (-- two --) -- a body part (1A) -- wearing -- the time -- a body part (1A) -- a side -- allocating -- having had -- an engagement part -- (-- four --) -- attachment and detachment -- free -- being engaged -- and -- the upper part (211) -- rotation -- free -- allocating -- having had -- an engagement piece (2c) -- having -- a thing -- it is -- constituting -- having .

[0029]The engaging mechanism of the engagement piece (2c) of this invention allocated in the engagement part (4) of a body part (1A) and the upper part (211) of a covering device (21) in the oxygen enricher [ like ] (A) the first operative condition is based on engagement of the crevice (41) of an engagement part (4), and the heights (2c') of an engagement piece (2c) (refer to drawing 3). Spring energization of the engagement piece (2c) of this invention allocated in the upper part (211) of said covering device (21) in the oxygen enricher [ like ] (A) the first operative condition enabling free rotation is carried out by the spring body (2d) (refer to drawing 3).

[0030]said composition of this invention carried out -- in an oxygen enricher [ like ] (A), a patient receives a body part (1A) the first operative condition -- a humidifier (2) -- one hand -- and with a one-touch method, it can attach certainly and easily or can demount. That is, by operating an engagement piece (2c) with a finger, a patient can attach a humidifier (2) to the body part (1A) of an oxygen enricher (A) easily, or can demount it while he grasps a humidifier (2) single hand. While a handle portion (23) can be allocated in a humidifier (2) and a patient grasps a handle portion (23) in this case in this invention, By operating an engagement piece (2c) with the thumb, a humidifier (2) can be attached much more certainly and easily by the body part (1A) of an oxygen enricher (A), or can be demounted. For this reason, the accident of the contingency which leads the fall of the oxygen gas amount of supply by the wearing fault of a humidifier (2), etc. can be prevented thoroughly.

[0031]using said drawing 1 carried out - drawing 3 -- this invention -- other composition of an oxygen enricher [ like ] or other additional composition are explained the first operative

condition.

[0032](i). a humidifier (2) has a connecting pipe (24) and filter (25) other than said covering device (21), a container part (22), and a handle portion (23), and is constituted so that it may be illustrated. Humidifying water is shown by the sign (w) among the figure (refer to drawing 3). Although it is needless to say, Said connecting pipe (24) leads the concentrating oxygen concentrated gas of the low humidity from said gas-evolution part (11) to the humidification service water (w) in the container part (22) of a humidifier (2), when the connecting part (2a) of the gas-evolution part (11) of a generation machine (1) and the upper part (211) of a covering device (21) is opened for free passage (refer to drawing 2). A filter (25) is for contacting the concentrating oxygen concentrated gas of low humidity to humidification service water (w) efficiently.

(ii). the concentrating oxygen concentrated gas of the high humidity humidified with the humidifier (2) passes along the hole of a covering device (21), is drawn by the gas taking-in part (31) of the oxygen supply port (3) opened for free passage by the communicating part (2b) (refer to drawing 2), and is supplied to a patient via KANYURA so that it may be illustrated.

[0033](iii). in this invention, as guidance (guide) for making a body part (1A) equip with a humidifier (2), as shown in drawing 1 - drawing 2, The upper part (211) of said humidifier (2) for showing the body part (1A) side to the upper part (211) of a humidifier (2) (Kaid) and the inside of a proposal (5) which has two incomes may be allocated.

(iv). in this invention, as shown in drawing 3, in order to position the humidifier (2) with which it is slid and equipped to a body part (1A), the positioning projected part (6) which contacts the pars basilaris ossis occipitalis (221) of a container part (22) may be allocated in the body part (1A) side.

[0034](v). in this invention, in order to improve the sealing nature of connection of the gas-evolution part (11) of a generation machine (1) and the gas taking-in part (31) of an oxygen supply port (3), and a communicating part (2a, 2b), as shown in drawing 1, Packings (refer to the reference mark 32 of drawing 1), such as a product made of silicone rubber, may be allocated in said gas-evolution part (11) and a gas taking-in part (31).

(vi). the hole (2e) of the upper part (211) of a covering device (21), and this Itabe's (1A) engagement part (4) in this invention, although it has two incomes and becomes guidance (guide) of wearing when making a body part (1A) equip with a humidifier (2) as shown in drawing 3, A spring body may be allocated in the inside of said hole (2e). At the moment of engagement of the crevice (41) of an engagement part (4) and the heights (2c') of an engagement piece (2c) being canceled by pushing an engagement piece (2c), a humidifier (2) is automatically extruded by said spring body, and can demount easily by it. In this kind of humidifier (2), the non-sanitary aspect by rust, adhesion of a microorganism, etc. must be considered, and allocation of the spring body inside said hole (2e) should be cared about in

this meaning. moreover -- facing wearing of a humidifier (2) and a body part (1A) so that clearly from said thing [ having carried out ] -- said hole (2e) -- the guide of wearing -- so-called -- it is -- the inside of a proposal of said (iii) (5) does not necessarily have necessity in this meaning.

[0035]Drawing 4 - drawing 6 are figures of this invention which illustrate an oxygen enricher [ like ] (A) the second operative condition. Drawing 4 - drawing 6 are said drawing 1 related to an oxygen enricher [ like ] (A) the first operative condition - a figure respectively corresponding to drawing 3.

[0036]The second operative condition, points which are shown in drawing 4 - drawing 6, which are shown in said drawing 1 - drawing 3 and which are greatly different from an oxygen enricher [ like ] (A) the first operative condition are the following points, and other composition has a substantially the same oxygen enricher [ like ] (A).

- (i). the gas-evolution part with packing (12) (11) by which the engagement part (4) allocated in the body part (1A) of an oxygen enricher (A) is piped from a generation machine (1), and the gas taking-in part with packing (32) (31) piped to an oxygen supply port (3) are allocated in a transverse direction by the same rank. Therefore, corresponding to the arrangement of said engagement part (4), a gas-evolution part (11), and a gas taking-in part (31), it has the structure where the upper part (211) of the covering device (21) of a humidifier (2) also corresponds.
- (ii). a gas-evolution part (11) and a gas taking-in part (31) are adjoined, and a spring body (4a, 4b) is allocated in the body part (1A) side. Said spring body (4a, 4b) has the same function as said spring body which sets like the first operative condition and is allocated inside a hole (2e) (refer to drawing 3). That is, at the moment of engagement of the crevice (41) of an engagement part (4) and the heights (2c') of an engagement piece (2c) being canceled by pushing an engagement piece (2c), a humidifier (2) is automatically extruded by said spring body (4a, 4b), and can demount easily by it.
- (iii). while being allocated to the upper part (211) of a covering device (21), enabling free rotation, in the part to which some engagement pieces (2c) (2f) contact a covering device (21), the elastic stop of the engagement piece (2c) which engages with an engagement part (4) is carried out. What is necessary is constituting an engagement piece (2c) and a lid (21) from a plastic material, and forming a male part and a female part in each, and making it just make it stop through elastic deformation, in order to carry out the elastic stop of said some of engagement pieces (2c) (2f) in the part which contacts a covering device (21). It is a thing needless to say that the desired region of some engagement versions (2c) (2f) and the upper part (211) of a lid (21) may be made to carry out an elastic stop.

[0037]Drawing 7 is a figure of this invention which illustrates an oxygen enricher [ like ] (A) the third operative condition. Drawing 7 is a figure corresponding to said drawing 3 related to an

oxygen enricher [ like ] (A) the first operative condition.

[0038]Points which are shown in drawing 7, for which an oxygen enricher [ like ] (A) is shown in said drawing 2 - drawing 3 the third operative condition and which are greatly different from an oxygen enricher [ like ] (A) the first operative condition are the following points, and other composition is the same in operation. It is based on the moving operation to said lower part of the locking piece (2c) set like the first operative condition and according [ engagement (lock) release of a body part (4) and a locking piece (2c) ] to a patient's thumb. On the other hand, engagement (lock) release [ like ] of a body part (4) and an engagement piece (2c) is performed the third operative condition that a patient moves up the hand which is grasping the handle portion (23) like a graphic display, i.e., by lifting the whole humidifier (2) upwards.

(i). for this reason, a body part (1A) is constituted so that it may have a projected part (1a) to which the end of an engagement piece (2c) is made to shift caudad -- and (ii) -- the upper part (211) of . covering device (21), It is constituted so that it may have a crevice (2g) which permits the downward shift of the end of the engagement piece (2c) by operation of said projected part (1a).

[0039]

[Effect of the Invention]This invention relates to the oxygen enricher currently widely used as oxygen therapy to a chronic respiratory failure patient etc. Especially this invention relates to the oxygen enricher which added improvement to the composition of the humidifier which is demounted from the main part of an oxygen enricher frequently because of a supplement of humidifying water, washing of a container, etc., and is attached.

[0040]In consideration of a patient's physical strength, aging, etc., in a humidifier, it is a patient's one hand and the body part of an oxygen enricher is provided certainly and easily with wearing and the oxygen enricher for oxygen therapy which can be demounted with a one-touch method by this invention.

[0041]Since the unexpected accident due to shortage of the oxygen gas amount of supply by the wearing fault of the humidifier to the body part of an oxygen enricher, etc., a fall, etc. is thoroughly prevented by this invention, the oxygen enricher excellent in safety for oxygen therapy is provided.

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TECHNICAL FIELD

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[Field of the Invention]This invention relates to the generator of the condensed oxygen gas used as oxygen therapy to a chronic respiratory failure patient (it may only be hereafter called a patient.) etc., i.e., the oxygen enricher for oxygen therapy, (it may only be hereafter called an oxygen enricher.).

[0002]It is related with the oxygen enricher made into the thing of structure which can deal with safely and easily the humidifier which is a component in which it is detailed and an oxygen enricher is important for this invention.

[0003]This invention relates to the oxygen enricher which made the humidifier which is an important component of an oxygen enricher the thing of the structure which can be dealt with safely and simple by operation of a patient's one hand in consideration of a patient's physical strength, aging, etc. in detail.

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PRIOR ART

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[Description of the Prior Art]In the domiciliary oxygen therapy (Home Oxygen Therapy;HOT) over a chronic respiratory disease, the oxygen enricher is widely used as the important tool. In said HOT, the method and air which use an oxygen cylinder, liquid oxygen, etc. as an oxygen supply system are processed by adsorbent, such as zeolite, and there are a method which obtains condensed oxygen gas, and a method which uses what is called an adsorbed type gas oxygen enricher.

[0005]The latter oxygen enricher has spread widely from excelling in simplicity, lightweight small size, low noise nature, etc. while the oxygen supply stable by remarkable improvement art in recent years is secured.

[0006]The outline of this kind of conventional adsorbed type oxygen enricher (A') is shown in drawing 8. So that it may be illustrated this kind of conventional adsorbed type oxygen enricher (A'), (i). an oxygen density being high and by mainly adsorbing nitrogen and the moisture in the air using adsorbent, while incorporating air, And the concentrating oxygen concentrated gas generation machine which makes concentrating oxygen concentrated gas with low humidity generate (1'), (ii). the humidifier (2') for humidifying the concentrating oxygen concentrated gas from said generation machine (1'), and (iii). -- it comprises an oxygen supply port (3') for presenting use with the concentrating oxygen concentrated gas humidified from said humidifier (2'). In drawing 8, each component (1', 2', 3') of the above mentioned oxygen enricher (A') is shown roughly. Said oxygen supply port (3') supplies the humidified concentrating oxygen concentrated gas to a patient's regio nasalis or mask (regio oralis) with cannula like a graphic display.

[0007]As drawing 8 explained, in this kind of oxygen enricher (A'), a humidifier (2') is an important component. When this is supplied to a patient as it is, a patient's nasal cavity membrane dries and it makes pain induce in a generation machine (1'), although dry (low humidity) concentrating oxygen concentrated gas is obtained. Therefore, a humidifier (2') is

indispensable because of the humidity control of concentrating oxygen concentrated gas.

[0008]Said humidifier (2') must satisfy the following needs seen from the field of handling operation of a patient side. Since an oxygen enricher (A') is used over a long period of time all day and night, daily removal and its frequency of attachment are high because of a liquid supplement of a humidifier, washing, etc. For this reason, consideration of a patient's physical strength, the inexperience on handling, the fall of thinking power, etc. desires strongly a thing of the method which removal of a humidifier (2') and operation of attachment can hold simple and certainly.

[0009]As described above, in an oxygen enricher (A'), a humidifier (2') is an important component and various improvement has been made. Hereafter, the example of 2-3 which are proposed about the handling of a humidifier (2') is explained.

[0010](i). JP,H6-39008,U: -- the main purpose of the device indicated by this published unexamined application detects whether attachment of a device body part and a humidifier is normal in the oxygen enricher of medical application, and when imperfect, it is related with the oxygen enricher for oxygen therapy which emitted the alarm. On the other hand, said published unexamined application is relation with said alarm system (alarm style), and is also indicating the mechanism which allocates a humidifier to a device body part enabling free attachment and detachment.

[0011]however, the upper part of the opening knob which constitutes the alarm system with which the thing of the indication to said published unexamined application serves as maintenance of a humidifier -- pushing up -- the opening knob concerned opens the holding state of a humidifier while operating MACROSS Izzi for alarm signal generating. And the patient can demount the humidifier (lock release was carried out) with which the holding state was wide opened as a following step from a device body part. That is, the thing of an indication of said published unexamined application cannot demount a humidifier from a device body part safely and easily with the one-touch method by a patient's one hand.

[0012](ii). JP,H5-154200,A: -- the invention indicated by this published unexamined application has proposed what made attachment of a humidifier and removal simple in the concentrated oxygen gas feed unit of medical application. In the concentrated oxygen gas feed unit of the medical application which has in detail a means (junction maintaining structure) by which the invention of an indication combines a humidifier with said published unexamined application to the humidifier seat part by the side of a device main frame, As a mechanism which demounts a humidifier from said seat part, the pressing movement of the opening knob of junction maintaining structure is made to carry out leftward, the tip of a fastening plate is removed from the trailer of a humidifier, and the thing of a method (lock release is carried out.) which opens the holding state of a humidifier is indicated.

[0013]However, the thing of said method cannot demount a humidifier from a device body part

safely and easily with the one-touch method by a patient's one hand, either.

[0014](iii). JP,H5-154201,A: -- the invention indicated by this published unexamined application has also proposed what made attachment of a humidifier and removal simple for said JP,H5-154200,A in the concentrated oxygen gas feed unit of medical application similarly. The invention of the indication to said published unexamined application receives the humidifier seat part by the side of a device main frame in detail, Along with the guide of said seat part, move a humidifier, and it positions, Subsequently, the feed unit of the method which sets a humidifier seat part and a humidifier so that the concentrated oxygen gas drawn from the generating means of concentrated oxygen gas in a device main frame may be supplied to a humidifier is indicated by operating the set knob allocated in said seat part. In said device, a humidifier will be in the state where it can demount from a humidifier seat part (if another word is carried out the device main frame side), by operating a set knob so that the holding state of a humidifier seat part and a humidifier may be opened (lock release).

[0015]However, the thing of said method as well as what was explained previously cannot demount a humidifier from a device body part safely and easily with the one-touch method by a patient's one hand.

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[Translation done.]



\* NOTICES \*

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## EFFECT OF THE INVENTION

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[Effect of the Invention]This invention relates to the oxygen enricher currently widely used as oxygen therapy to a chronic respiratory failure patient etc. Especially this invention relates to the oxygen enricher which added improvement to the composition of the humidifier which is demounted from the main part of an oxygen enricher frequently because of a supplement of humidifying water, washing of a container, etc., and is attached.

[0040]In consideration of a patient's physical strength, aging, etc., in a humidifier, it is a patient's one hand and the body part of an oxygen enricher is provided certainly and easily with wearing and the oxygen enricher for oxygen therapy which can be demounted with a one-touch method by this invention.

[0041]Since the unexpected accident due to shortage of the oxygen gas amount of supply by the wearing fault of the humidifier to the body part of an oxygen enricher, etc., a fall, etc. is thoroughly prevented by this invention, the oxygen enricher excellent in safety for oxygen therapy is provided.

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[Translation done.]

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention]This invention is originated in view of the limit seen from the fault of the above mentioned conventional oxygen enricher, and the handling nature of the humidifier which is especially the important component.

[0017]This invention persons added examination wholeheartedly that the fault of the handling nature of the humidifier proposed from the above mentioned former should be canceled. As a result, in the oxygen enricher which has attachment and a humidifier which can be demounted in a sliding type to the main part of an oxygen enricher, A patient is one hand by having two incomes with the locking piece which is allocated by the suspending portion allocated in the main part side of an oxygen enricher, and the covering device of a humidifier, enabling free rotation, and is engaged [ said suspending portion and ] and stops, and it found out attachment and that it could demount for the humidifier to the oxygen enricher with the one-touch method.

[0018]This invention uses said knowledge as a base, and is completed. The oxygen enricher for oxygen therapy with high added value which incorporated the humidifier which a patient can deal with simple and certainly by this invention is provided.

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## MEANS

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[Means for Solving the Problem]A concentrating oxygen concentrated gas generation machine (1) which will make concentrating oxygen concentrated gas with low humidity this invention generate highly [ an oxygen density for oxygen therapy ] if this invention is outlined, A humidifier (2) for humidifying concentrating oxygen concentrated gas from said generation machine (1), And an oxygen supply port (3) which presents use with concentrating oxygen concentrated gas humidified from said humidifier (2), While being an oxygen enricher for the oxygen therapy, \*\* and others, (A) and allocating said generation machine (1) and an oxygen supply port (3) in the body part (1A) side of an oxygen enricher (A), Said humidifier (2) in an oxygen enricher for oxygen therapy of structure (A) with which said body part (1A) is equipped enabling free attachment and detachment (i). aforementioned humidifier (2), Have a container part (22) which accommodates a covering device (21) and humidifying water, and it is constituted, and (ii). aforementioned covering device (21), a communicating part (2a.) which is open for free passage to each of a gas-evolution part (11) of said generation machine (1), and a gas taking-in part (31) of an oxygen supply port (3) which was allocated in the upper part (211) at the time of wearing to a body part (1A) of a humidifier (2) as for a body part (1A) side Have 2b), and it is constituted and (iii). aforementioned covering device (21) in the upper part (211). It is related with an oxygen enricher for oxygen therapy which having an engagement piece (2c) which engages with an engagement part (4) allocated in the body part (1A) side at the time of wearing to a body part (1A) of a humidifier (2) enabling free attachment and detachment, and which can be rotated, and constituting.

[0020]

[Embodiment of the Invention]Hereafter, Drawings are made reference and technical constitution and the embodiment of this invention are explained in detail. It is needless to say that this invention is not limited to the thing of a graphic display.

[0021]Drawing 8 which described the main component of the device above in the explanation

which refers to the Drawings of the oxygen enricher (A) of this invention

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]It is an important section perspective view of the oxygen enricher (A) of the first embodiment of this invention.

[Drawing 2]It is the top view which saw through a part of drawing 1.

[Drawing 3]It is an I-I line sectional view of drawing 2.

[Drawing 4]It is an important section perspective view of the oxygen enricher (A) of the second embodiment of this invention.

[Drawing 5]It is the top view which saw through a part of drawing 4.

[Drawing 6]It is an II-II line sectional view of drawing 5.

[Drawing 7]It is a figure of this invention which illustrates an oxygen enricher [ like ] (A) the third operative condition, and is a figure corresponding to drawing 3 [ like ] the first operative condition.

[Drawing 8]It is a perspective view of the conventional oxygen enricher (A').

[Description of Notations]

A ..... Oxygen enricher of this invention

A' ..... The conventional oxygen enricher

1 1' ..... Concentrating oxygen concentrated gas generation machine

11 ..... Gas-evolution part

12 ..... Packing

1a ..... Projected part

2 2' ..... Humidifier

21 ..... Covering device

211 ..... Upper part (covering device)

22 ..... Container part

221 ..... Pars basilaris ossis occipitalis (container part)

23 ..... Handle portion  
24 ..... Connecting pipe  
25 ..... Filter  
w ..... Humidification service water  
2a, 2b ..... Communicating part  
2c ..... Locking piece  
2c' ..... Heights (locking piece)  
2 d ..... Spring body  
2 f ..... Resilient engagement part  
2e ..... Hole  
2 g ..... Projected part  
3 3' ..... Oxygen supply port  
4 ..... Engagement part  
41 ..... Crevice (engagement part)  
5 ..... Inside of a proposal  
6 ..... Positioning projected part

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[Translation done.]

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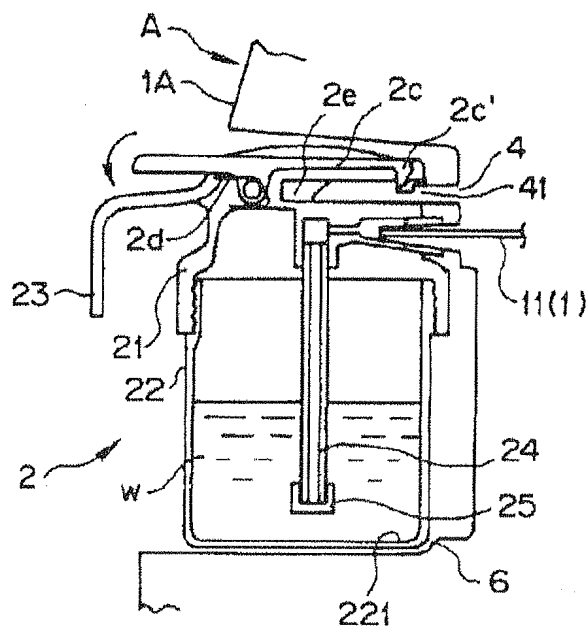
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(54) 【発明の名称】 酸素療法用酸素濃縮装置

(57) 【要約】 (修正有)

【課題】 加湿器部の取付けや取外し操作を簡便にした酸素療法用の酸素濃縮器を提供する。

【解決手段】 酸素濃縮ガス生成器1、加湿するための加湿器2、及び加湿された酸素濃縮ガスを使用に供する酸素供給口、からなる酸素療法用酸素濃縮装置Aであって、かつ、生成器と酸素供給口が酸素濃縮装置の本体部1A側に配設されるとともに、加湿器が本体部に着脱自在に装着される構造の酸素療法用酸素濃縮装置において、加湿器は、蓋部21及び加湿水を収容する容器部22を有し、蓋部は、その上部に、加湿器の本体部への装着時に本体部側配設された生成器のガス放出部11と酸素供給口のガス取込部の夫々に連通する連通部を有するもので構成される。蓋部は、その上部に、加湿器の本体部への装着時に本体部側に配設された係合部4と着脱自在に係合する回転自在の係合片2cを有する。を特徴とする酸素療法用酸素濃縮装置。



【特許請求の範囲】

【請求項1】 酸素療法用の酸素濃度が高く、かつ湿度の低い酸素濃縮ガスを生成させる酸素濃縮ガス生成器

(1)、前記生成器(1)からの酸素濃縮ガスを加湿するための加湿器(2)、及び前記加湿器(2)からの加湿された酸素濃縮ガスを使用に供する酸素供給口

(3)、からなる酸素療法用酸素濃縮装置(A)であって、かつ、前記生成器(1)と酸素供給口(3)が酸素濃縮装置(A)の本体部(1A)側に配設されるとともに、前記加湿器(2)が前記本体部(1A)にスライドさせて着脱自在に装着される構造の酸素療法用酸素濃縮装置(A)において、

(i). 前記加湿器(2)は、蓋部(21)及び加湿水を収容する容器部(22)を有するもので構成され、

(ii). 前記蓋部(21)は、その上部(211)に、加湿器(2)の本体部(1A)への装着時に本体部(1A)側に配設された前記生成器(1)のガス放出部(11)と酸素供給口(3)のガス取込部(31)の夫々に連通する連通部(2a、2b)を有するもので構成され、かつ、

(iii). 前記蓋部(21)は、その上部(211)に、加湿器(2)の本体部(1A)への装着時に本体部(1A)側に配設された係合部(4)と着脱自在に係合する回動自在の係合片(2c)を有するもので構成されたこと、を特徴とする酸素療法用酸素濃縮装置。

【請求項2】 加湿器(2)が、取手部(23)を有するものである請求項1に記載の酸素療法用酸素濃縮装置。

【請求項3】 本体部(1A)の係合部(4)と蓋部(21)の係合片(2c)の係合機構が、係合部(4)の凹部(41)と係合片(2c)の凸部(2c')の係合によるものである請求項1に記載の酸素療法用酸素濃縮装置。

【請求項4】 蓋部(21)の係合片(2c)が回動自在にパネ付勢されて蓋体(21)の上部(211)に配設されたものである請求項1に記載の酸素療法用酸素濃縮装置。

【請求項5】 本体部(1A)が、加湿器(2)を本体部(1A)へ装着案内するために、蓋部(21)の上部(211)を案内する案内部(5)を有するものである請求項1に記載の酸素療法用酸素濃縮装置。

【請求項6】 本体部(1A)が、本体部(1A)へ装着される加湿器(2)の位置決めをするために、加湿器(2)の容器部(22)の底部(221)に当接する位置決め突部(6)を有するものである請求項1に記載の酸素療法用酸素濃縮装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、慢性の呼吸不全患者など(以下、単に患者ということがある。)に対する

酸素療法として使用される濃縮酸素ガスの発生装置、即ち酸素療法用の酸素濃縮装置(以下、単に酸素濃縮装置ということがある。)に関する。

【0002】 詳しくは、本発明は、酸素濃縮装置の重要な構成要素である加湿器を安全かつ容易に取扱える構造のものとした酸素濃縮装置に関する。

【0003】 更に詳しくは、本発明は、患者の体力、高齢化などに配慮し、酸素濃縮装置の重要な構成要素である加湿器を、患者の片手の操作により安全かつ簡便に取扱える構造のものにした酸素濃縮装置に関するものである。

【0004】

【従来の技術】 慢性呼吸器疾患に対する在宅酸素療法(Home Oxygen Therapy; HOT)において、その重要なツールとして酸素濃縮装置は広く使用されている。前記HOTにおいて、酸素供給システムとして酸素ボンベ、液体酸素などを使用する方式と空気をゼオライトなどの吸着体で処理し、濃縮酸素ガスを得る方式、いわゆる、吸着型ガス酸素濃縮装置を使用する方式とがある。

【0005】 後者の酸素濃縮装置は、近年、めざましい改良技術により安定した酸素供給が確保されるとともに、簡便、軽量小型、かつ低騒音性などに優れていることから広く普及している。

【0006】 この種の従来の吸着型酸素濃縮装置(A')の概要は、図8に示されている。図示されるように、この種の従来の吸着型酸素濃縮装置(A')は、(i). 空気を取込むとともに、主に空気中の窒素及び水分を吸着剤を利用して吸着することにより酸素濃度が高く、かつ湿度の低い酸素濃縮ガスを生成させる酸素濃縮ガス生成器(1')、(ii). 前記生成器(1')からの酸素濃縮ガスを加湿するための加湿器(2')、及び、(iii). 前記加湿器(2')からの加湿された酸素濃縮ガスを使用に供するための酸素供給口(3')、とから構成されるものである。図8において、前記した酸素濃縮装置(A')の各構成要素(1'、2'、3')は、概略的に示されている。なお、前記酸素供給口(3')は、加湿された酸素濃縮ガスを図示のようにカニューレにより患者の鼻部またはマスク(口部)へ供給するものである。

【0007】 図8で説明したように、この種の酸素濃縮装置(A')において、加湿器(2')は重要な構成要素である。これは、生成器(1')において、乾燥した(低湿度)の酸素濃縮ガスが得られるが、このまま患者に供給すると、患者の鼻腔粘膜が乾燥し、苦痛を誘発させる。従って、加湿器(2')は、酸素濃縮ガスの湿度調整のために必要不可欠のものである。

【0008】 また、前記加湿器(2')は、患者サイドの取扱い操作の面からみると、次のようなニーズを満足しなければならないものである。酸素濃縮装置(A')は、昼夜を問わず、長期間にわたって使用されるため、



加湿器の液補充や洗浄などのために毎日の取外し、取付けの頻度が高いものである。このため、患者の体力、取扱い上の不慣れ、思考力の低下などを考慮すると、加湿器（２）の取外し、取付けの操作が簡便かつ確実にこなえる方式のものが強く望まれている。

【０００９】前記したように、酸素濃縮装置（Ａ）において、加湿器（２）は重要な構成要素であり、種々の改良がなされてきている。以下、加湿器（２）の取扱いに関して提案されている二～三の例を説明する。

【００１０】(i). 実開平６－３９００８号公報：この公開公報に開示された考案の主たる目的は、医療用の酸素濃縮装置において、装置本体部と加湿器の取付けが正常であるか否かを検知し、不完全なときに警報を発するようにした酸素療法用の酸素濃縮装置に関するものである。一方、前記公開公報は、前記警報システム（警報機構）との関連で、加湿器を装置本体部へ着脱自在に配設する機構をも開示している。

【００１１】しかしながら、前記公開公報に開示のものは、加湿器の保持を兼ねる警報システムを構成する開放ノブの上方への押上げにより、当該開放ノブは警報信号発生用のマクロスイッチを作動させるとともに、加湿器の保持状態を開放するものである。そして、患者は、次のステップとして保持状態が開放された（ロック解除された）加湿器を装置本体部から取外すことができるものである。即ち、前記公開公報が開示のものは、患者の片手によるワンタッチ方式により安全かつ容易に加湿器を装置本体部から取外すことができないものである。

【００１２】(ii). 特開平５－１５４２００号公報：この公開公報に開示された発明は、医療用の酸素濃縮気体供給装置において、加湿器の取付け、取外しを簡便にしたものを提案している。詳しくは、前記公開公報に開示の発明は、装置本体側の加湿器収容部に対して加湿器を結合させる手段（接合保持機構）を有する医療用の酸素濃縮気体供給装置において、前記収容部から加湿器を取外す機構として、接合保持機構の開放ノブを左方向に押圧移動させ、止め金具の先端を加湿器の終端部より外し、加湿器の保持状態を開放する（ロック解除する。）方式のものを開示している。

【００１３】しかしながら、前記方式のものも、患者の片手によるワンタッチ方式により安全かつ容易に加湿器を装置本体部から取外すことができないものである。

【００１４】(iii). 特開平５－１５４２０１号公報：この公開公報に開示された発明も、前記特開平５－１５４２００号公報を同様に医療用の酸素濃縮気体供給装置において、加湿器の取付け、取外しを簡便にしたものを提案している。詳しくは、前記公開公報に開示の発明は、装置本体側の加湿器収容部に対して、加湿器を前記収容部のガイドに沿って移動させて、位置決めし、次いで前記収容部に配設したセットノブを操作することにより装置本体内の酸素濃縮気体の発生手段から導出される酸素

濃縮気体を加湿器に供給するように加湿器収容部と加湿器をセットする方式の供給装置を開示している。なお、前記装置において、セットノブを加湿器収容部と加湿器の保持状態を開放（ロック解除）するように操作することにより、加湿器は加湿器収容部（別言すれば、装置本体側）から取外せる状態になるものである。

【００１５】しかしながら、前記方式のものも、先に説明したものと同様に、患者の片手によるワンタッチ方式により安全かつ容易に加湿器を装置本体部から取外すことができないものである。

【００１６】

【発明が解決しようとする課題】本発明は、前記した従来の酸素濃縮装置の欠点、特にその重要な構成要素である加湿器の取扱い性からみた限界に鑑み、創案されたものである。

【００１７】本発明者らは、前記した従来から提案されている加湿器の取扱い性の欠点を解消すべく鋭意検討を加えた。その結果、酸素濃縮装置の本体に対してスライド式に取付け及び取外すことができる加湿器を有する酸素濃縮装置において、酸素濃縮装置の本体側に配設された係止部と加湿器の蓋部に回動自在に配設され、かつ前記係止部と係合、係止する係止片との共働により、患者は、片手がかつワンタッチ方式により加湿器を酸素濃縮装置へ取付け及び取外すことができることを見出した。

【００１８】本発明は、前記知見をベースにして完成されたものである。本発明により、患者が簡便かつ確実に取扱える加湿器を組込んだ付加価値の高い酸素療法用の酸素濃縮装置が提供される。

【００１９】

【課題を解決するための手段】本発明を概説すれば、本発明は、酸素療法用の酸素濃度が高く、かつ湿度の低い酸素濃縮ガスを生成させる酸素濃縮ガス生成器（１）、前記生成器（１）からの酸素濃縮ガスを加湿するための加湿器（２）、及び前記加湿器（２）からの加湿された酸素濃縮ガスを使用に供する酸素供給口（３）、からなる酸素療法用酸素濃縮装置（Ａ）であって、かつ、前記生成器（１）と酸素供給口（３）が酸素濃縮装置（Ａ）の本体部（１Ａ）側に配設されるとともに、前記加湿器（２）が前記本体部（１Ａ）に着脱自在に装着される構造の酸素療法用酸素濃縮装置（Ａ）において、(i). 前記加湿器（２）は、蓋部（２１）及び加湿水を収容する容器部（２２）を有するもので構成され、(ii). 前記蓋部（２１）は、その上部（２１１）に、加湿器（２）の本体部（１Ａ）への装着時に本体部（１Ａ）側配設された前記生成器（１）のガス放出部（１１）と酸素供給口（３）のガス取込部（３１）の夫々に連通する連通部（２ａ、２ｂ）を有するもので構成され、かつ、(iii). 前記蓋部（２１）は、その上部（２１１）に、加湿器（２）の本体部（１Ａ）への装着時に本体部（１Ａ）側

に配設された係合部（４）と着脱自在に係合する回動自在の係合片（２ｃ）を有するもので構成されたこと、を特徴とする酸素療法用酸素濃縮装置に関するものである。

【００２０】

【発明の実施の形態】以下、本発明の技術的構成及び実施態様を図面を参照にして詳しく説明する。なお、本発明は図示のものに限定されないことはいうまでもないことである。

【００２１】また、本発明の酸素濃縮装置（Ａ）の図面を参照しての説明において、装置の主たる構成要素は、前記した図８（従来技術）に示される酸素濃縮装置（Ａ'）が参照されるべきである。ここにおいて、本発明の酸素濃縮装置（Ａ）の構成要素は、ダッシュ記号なしの参照符号で説明されているが、従来の対応する構成要素は、ダッシュ記号付きで説明されている。

【００２２】図１～図３は、本発明の第一実施態様の酸素濃縮装置（Ａ）を説明する図である。図１は、本発明の酸素濃縮装置（Ａ）の本体部（１Ａ）に対する加湿器（２）の着脱機構を説明するための要部説明図である。図２は、図１の平面図である。図３は、図２のＩ－Ｉ線断面図である。

【００２３】図１に示されるように、本発明の酸素濃縮装置（Ａ）は、その主たる構成要素は従来と同様に（図８参照）、(i). 空気を取込むとともに、主に空気中の窒素及び水分を吸着剤を利用して吸着することにより酸素濃度が高く、かつ湿度の低い酸素濃縮ガスを生成させる酸素濃縮ガス生成器（１）、(ii). 前記生成器（１）からの酸素濃縮ガスを加湿するための加湿器（２）、及び、(iii). 前記加湿器（２）からの加湿された酸素濃縮ガスを使用に供する酸素供給口（３）、とから構成されるものである。

【００２４】また、本発明の酸素濃縮装置（Ａ）において、前記生成器（１）と酸素供給口（３）は酸素濃縮装置（Ａ）の本体部（１Ａ）側にコンパクトに配設され、かつ前記加湿器（２）は本体部（１Ａ）側に着脱自在に装着されるように構成されるものである。

【００２５】そして、本発明の酸素濃縮装置（Ａ）の最大の特徴点は、詳しくは後述するが、加湿器（２）の本体部（１Ａ）に対する着脱機構とその構成の点にある。

【００２６】本発明の酸素濃縮装置（Ａ）において、他の構成要素あるいは機構は、以下に説明するように、従来のものと同種であると考えてよい。

(i). 前記酸素濃縮ガス生成器（１）は、例えば、ゼオライト等の吸着剤を利用した吸着型のもので構成される。なお、本発明において、酸素濃縮ガス生成器（１）は、酸素ポンプ、液体酸素など空気よりも高濃度の酸素ガスを供給する他の供給源を包含することはいうまでもないことである。

(ii). 前記酸素濃縮ガスを使用に供する酸素供給口

（３）は、加湿器（２）から導出される加湿された酸素濃縮ガスを患者に供給する機器で構成され、例えば、カニューラホースを通じて、加湿された酸素濃縮ガスを患者の鼻孔（鼻カニューラ方式）あるいは口腔（マスク方式）に供給する。

【００２７】次に、本発明の酸素濃縮装置（Ａ）の最大の特徴点である加湿器（２）の本体部（１Ａ）に対する着脱機構とその構成について、以下、詳しく説明する。図１～図３に示されるように、加湿器（２）を酸素濃縮装置（Ａ）の本体部（１Ａ）に対して患者の片手による操作のみで、かつワンタッチ方式で着脱自在に装着させるために、加湿器（２）と本体部（１Ａ）の両者の構成は、次のように規定されるものである。

【００２８】(i). 本発明の加湿器（２）は、蓋部（２１）、蒸留精製水などの加湿水を収容する容器部（２２）、及び取手部（２３）を有するもので構成される。(ii). そして、前記蓋部（２１）は、その上部（２１１）に、加湿器（２）の本体部（１Ａ）への装着時に本体部（１Ａ）側に配設された生成器（１）のガス放出部（１１）と、酸素供給口（３）のガス取込部（３１）の夫々に連通する連通部（２ａ、２ｂ）を有するもので構成される。

(iii). 更に、前記蓋部（２１）は、その上部（２１１）に、加湿器（２）の本体部（１Ａ）への装着時に本体部（１Ａ）側に配設された係合部（４）と着脱自在に係合し、かつ上部（２１１）に回動自在に配設された係合片（２ｃ）を有するもので構成される。

【００２９】本発明の第一実施態様の酸素濃縮装置（Ａ）において、本体部（１Ａ）の係合部（４）と蓋部（２１）の上部（２１１）に配設された係合片（２ｃ）の係合機構は、係合部（４）の凹部（４１）と係合片（２ｃ）の凸部（２ｃ'）の係合によるものである（図３参照）。また、本発明の第一実施態様の酸素濃縮装置（Ａ）において、前記蓋部（２１）の上部（２１１）に回動自在に配設された係合片（２ｃ）は、バネ体（２ｄ）（図３参照）によりバネ付勢されている。

【００３０】本発明の前記した構成の第一実施態様の酸素濃縮装置（Ａ）において、患者は、本体部（１Ａ）に対して加湿器（２）を片手により、かつワンタッチ方式により、確実にかつ容易に取付けたり取外したりすることができる。即ち、患者は、片手で加湿器（２）を把持するとともに、指で係合片（２ｃ）を操作することにより、加湿器（２）を酸素濃縮装置（Ａ）の本体部（１Ａ）に容易に取付けたり取外したりすることができる。また、本発明においては、加湿器（２）に取手部（２３）を配設することができるものであり、この場合、患者は取手部（２３）を把持するとともに、親指で係合片（２ｃ）を操作することにより、加湿器（２）を酸素濃縮装置（Ａ）の本体部（１Ａ）により一層確実にかつ容易に取付けたり取外したりすることができる。このため、

加湿器（２）の装着不具合による酸素ガス供給量の低下などを通じての不測の事故を完全に防止することができる。

【００３１】前記した図１～図３を利用して、本発明の第一実施態様の酸素濃縮装置の他の構成あるいは他の付加的構成を説明する。

【００３２】(i). 図示されるように、加湿器（２）は、前記蓋部（２１）、容器部（２２）、及び取手部（２３）の他に、導圧管（２４）やフィルター（２５）を有するもので構成される。なお、図中（図３参照）、加湿水は、記号（w）で示されている。なお、いうまでもないことであるが、前記導圧管（２４）は、生成器（１）のガス放出部（１１）と蓋部（２１）の上部（２１１）の連結部（２a）が連通されたとき（図２参照）、前記ガス放出部（１１）からの低湿度の酸素濃縮ガスを加湿器（２）の容器部（２２）内の加湿用水（w）へ導くものである。また、フィルター（２５）は、低湿度の酸素濃縮ガスを加湿用水（w）と効率的に接触させるためのものである。

(ii). 図示されるように、加湿器（２）により加湿された高湿度の酸素濃縮ガスは、蓋部（２１）の穴部（２e）を通して、連通部（２b）により連通された酸素供給口（３）のガス取込部（３１）に導出され（図２参照）、カニューラを介して患者に供給される。

【００３３】(iii). 本発明において、図１～図２に示されるように、加湿器（２）を本体部（１A）へ装着させるための案内（ガイド）として、本体部（１A）側に、加湿器（２）の上部（２１１）を案内（ガイド）するための前記加湿器（２）の上部（２１１）と共働する案内（５）を配設してもよい。

(iv). 本発明において、図３に示されるように、本体部（１A）に対してスライドして装着される加湿器（２）の位置決めを行なうために、本体部（１A）側に、容器部（２２）の底部（２２１）と当接する位置決め突部（６）を配設してもよい。

【００３４】(v). 本発明において、図１に示されるように、生成器（１）のガス放出部（１１）及び酸素供給口（３）のガス取込部（３１）と連通部（２a、２b）の接続のシール性を改善するために、前記ガス放出部（１１）及びガス取込部（３１）にシリコンゴム製などのパッキング（図１の参照符号３参照）を配設してもよい。

(vi). 本発明において、図３に示されるように、加湿器（２）を本体部（１A）へ装着させるとき、蓋部（２１）の上部（２１１）の穴部（２e）と本板部（１A）の係合部（４）は、共働して装着の案内（ガイド）となるものであるが、前記穴部（２e）の内部にバネ体を配設してもよい。前記バネ体により、係合部（４）の凹部（４１）と係合片（２c）の凸部（２c'）の係合が、係合片（２c）を押すことにより解除された瞬間に加湿

器（２）が自動的に押出され容易に取外すことができる。なお、この種の加湿器（２）においては、錆や微生物の付着などによる非衛生面を配慮しなければならず、この意味において、前記穴部（２e）の内部へのバネ体の配設には留意すべきである。また、前記したことから明らかのように、加湿器（２）と本体部（１A）の装着に際して、前記穴部（２e）は装着のガイドともなるものであり、この意味で前記(iii)の案内（５）は必ずしも必要がないものである。

【００３５】図４～図６は、本発明の第二実施態様の酸素濃縮装置（A）を説明する図である。なお、図４～図６は、前記第一実施態様の酸素濃縮装置（A）に関する図１～図３にそれぞれ対応する図である。

【００３６】図４～図６に示される第二実施態様の酸素濃縮装置（A）が、前記図１～図３に示される第一実施態様の酸素濃縮装置（A）と大きく異なる点は、以下の点であり、その他の構成は実質的に同じである。

(i). 酸素濃縮装置（A）の本体部（１A）に配設される係合部（４）は、生成器（１）から配管されるパッキング（１２）付きガス放出部（１１）と酸素供給口（３）へ配管されるパッキング（３２）付きガス取込部（３１）が横方向に同列に配設される。従って、前記係合部（４）、ガス放出部（１１）、及びガス取込部（３１）の配列に対応して、加湿器（２）の蓋部（２１）の上部（２１１）も対応する構造となっている。

(ii). ガス放出部（１１）とガス取込部（３１）に隣接して本体部（１A）側にバネ体（４a、４b）が配設される。前記バネ体（４a、４b）は、前記第一実施態様において穴部（２e）（図３参照）の内部に配設されるバネ体と同様の機能を有するものである。即ち、前記バネ体（４a、４b）により、係合部（４）の凹部（４１）と係合片（２c）の凸部（２c'）の係合が、係合片（２c）を押すことにより、解除された瞬間に加湿器（２）が自動的に押出され、容易に取外すことができる。

(iii). 係合部（４）に係合する係合片（２c）は、蓋部（２１）の上部（２１１）に対して回転自在に配設されるとともに、係合片（２c）の一部（２f）が蓋部（２１）と当接する部位において弾性係止される。前記係合片（２c）の一部（２f）を蓋部（２１）と当接する部位において弾性係止させるには、係合片（２c）と蓋体（２１）をプラスチック材で構成し、かつそれぞれにオス部とメス部を形成し、弾性変形を通じて係止させるようにすればよい。なお、係合片（２c）の一部（２f）、蓋体（２１）の上部（２１１）の所望部位に弾性係止させてもよいことはいうまでもないことである。

【００３７】図７は、本発明の第三実施態様の酸素濃縮装置（A）を説明する図である。なお、図７は、前記第一実施態様の酸素濃縮装置（A）に関する図３に対応する図である。

【0038】図7に示される第三実施態様の酸素濃縮装置(A)が、前記図2～図3に示される第一実施態様の酸素濃縮装置(A)と大きく異なる点は、以下の点であり、その他の構成は実施的に同じである。前記第一実施態様において、本体部(4)と係止片(2c)の係合(ロック)解除は、患者の親指による係止片(2c)の下方への移動操作によるものである。これに対して、第三実施態様の本体部(4)と係合片(2c)の係合(ロック)解除は、図示のように、患者が取手部(23)を把持している手を上方に移動させることにより、即ち、加湿器(2)全体を上方へ持ち上げることにより行なうものである。

(i).このため、本体部(1A)は、係合片(2c)の端部を下方に移行させる突部(1a)を有するように構成され、かつ、(ii).蓋部(21)の上部(211)は、前記突部(1a)の作用による係合片(2c)の端部の下方移動を許容する凹部(2g)を有するように構成される。

【0039】

【発明の効果】本発明は、慢性の呼吸不全患者などに対する酸素療法として広く使用されている酸素濃縮装置に関する。特に、本発明は、加湿水の補充や容器の洗浄などのために頻繁に酸素濃縮装置本体から取外され、かつ取り付けられる加湿器の構成に改良を加えた酸素濃縮装置に関する。

【0040】本発明により、患者の体力、高齢化などに配慮し、加湿器を酸素濃縮装置の本体部に患者の片手で、かつワンタッチ方式により確実かつ容易に装着かつ取外すことができる酸素療法用の酸素濃縮装置が提供される。

【0041】また、本発明により、酸素濃縮装置の本体部に対する加湿器の装着不具合等による酸素ガス供給量の不足、低下などによる不測の事故が完全に防止されるため、安全性に優れた酸素療法用の酸素濃縮装置が提供される。

【図面の簡単な説明】

【図1】 本発明の第一実施態様の酸素濃縮装置(A)の要部斜視図である。

【図2】 図1の一部を透視した平面図である。

【図3】 図2のI-I線断面図である。

【図4】 本発明の第二実施態様の酸素濃縮装置(A)の要部斜視図である。

【図5】 図4の一部を透視した平面図である。

【図6】 図5のII-II線断面図である。

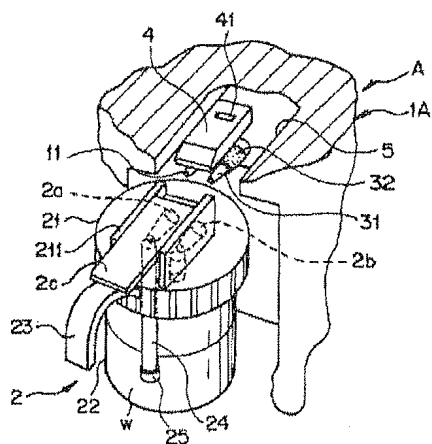
【図7】 本発明の第三実施態様の酸素濃縮装置(A)を説明する図であり、第一実施態様の図3に対応する図である。

【図8】 従来の酸素濃縮装置(A')の斜視図である。

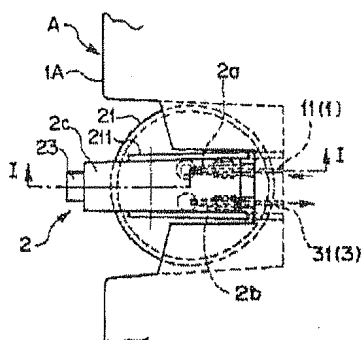
【符号の説明】

A	.....	本発明の酸素濃縮装置
A'	.....	従来の酸素濃縮装置
1、1'	.....	酸素濃縮ガス生成器
11	.....	ガス放出部
12	.....	パッキング
1a	.....	突部
2、2'	.....	加湿器
21	.....	蓋部
211	.....	(蓋部の) 上部
22	.....	容器部
221	.....	(容器部の) 底部
23	.....	取手部
24	.....	導圧管
25	.....	フィルター
w	.....	加湿用水
2a、2b	.....	連通部
2c	.....	係止片
2c'	.....	(係止片の) 凸部
2d	.....	バネ体
2f	.....	弾性係合部
2e	.....	穴部
2g	.....	突部
3、3'	.....	酸素供給口
4	.....	係合部
41	.....	(係合部の) 凹部
5	.....	案内部
6	.....	位置決め突部

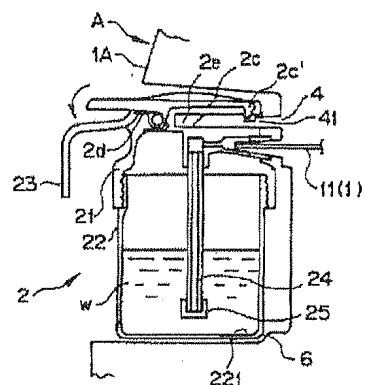
【図1】



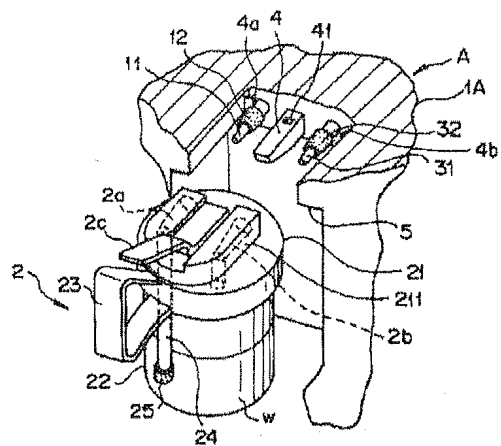
【図2】



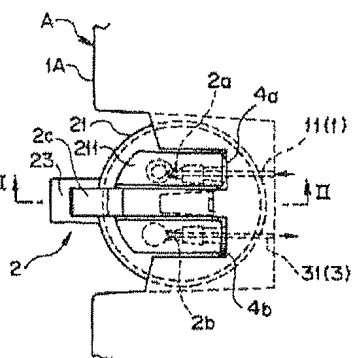
【図3】



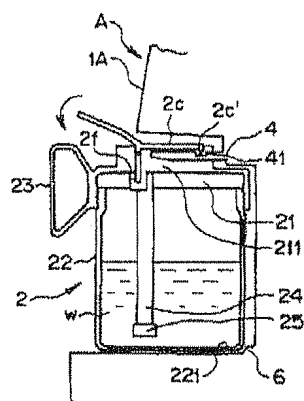
【図4】



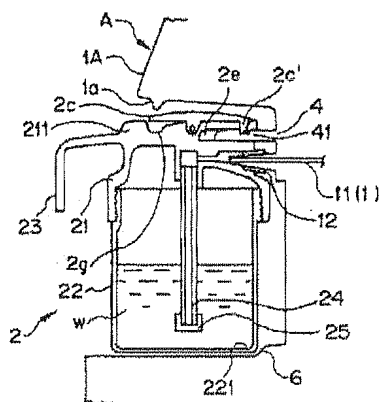
【図5】



【図6】



【図7】



【図8】

